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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,954	07/24/2001	Kevin J. Youngers	10018165-1	5715

7590 11/18/2005

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
LAROSE, COLIN M	

ART UNIT	PAPER NUMBER
2627	

DATE MAILED: 11/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

MAILED

NOV 18 2005

Technology Center 2600

Application Number: 09/911,954
Filing Date: July 24, 2001
Appellant(s): YOUNGERS, KEVIN J.

David N. Fogg
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/29/05 appealing from the Office action mailed 2/16/05.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,854,859	SOBOL	12-1998
5,214,470	DENDER	5-1993

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims (repeated verbatim from the Final Rejection dated 2/16/05):

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-20, 22-24, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,854,859 by Sobol.

Regarding claim 1, Sobol discloses a method of processing color image data, comprising:

(a) examining the color components of a pixel in the image (column 2, lines 14-25: pixels are examined to determine whether they are of higher intensity or lower intensity; Sobol's method is applicable on pixels with color components (column 4, lines 30-37));

(b) selectively applying a matrix to the color components of the pixel to create an output color component only when the pixel is not in a dark area of the image (column 2, lines 14-25: pixels with low intensity are not filtered with the Laplacian matrix (see column 2, lines 56-68)).

Regarding claim 2, Sobol's method is repeated for each pixel in the image (i.e. the entire image is filtered).

Regarding claim 3, Sobol discloses blending the transition between pixels in the image that are in a dark area and pixels in the image that are not in a dark area (figure 1C: pixels with high values are strongly filtered; pixels with low values are not/weakly filtered; and pixels in the

mid-range are filtered by a mid-range filter, so that the transition from strong to weak filtering is blended).

Regarding claim 4, Sobol discloses a method of processing color image data contained in an array of pixels, comprising:

selecting at least one threshold (column 4, lines 24-30: a threshold of 60 is selected);

(a) reading the color components of a pixel (column 2, lines 14-25: pixels are examined to determine their relationship to the threhsold; Sobol's method is applicable on pixels with color components (column 4, lines 30-37));;

(b) transforming the color components of the pixel with a matrix when any of the color components of the pixel are greater than the threshold and otherwise preserving the pixel (column 4, lines 24-30: pixels below the threshold of 60 are not filtered).

Regarding claim 5, Sobol's method is repeated for essentially each pixel in the array (i.e. the entire image is filtered).

Regarding claim 6, Sobol discloses a method of processing color image data contained in an array of pixels, comprising:

(a) defining at least one threshold (column 3, lines 45-53: a threshold of 10 is selected);

(b) defining a first and a second matrix (column 3, lines 45-53: two matrices with different K values of 8 and 4 are defined according to the Laplacian equation at column 2, lines 66-67);

(c) reading at least 3 color components for the pixel (column 4, lines 31-37: R, G, and B color components are read for each pixel);

(d) applying the first matrix to the color components of the pixel to create an output color component when any of the color components are greater than the threshold (column 3, lines 45-55: a first matrix with K=4 is applied when the color component values are above the threshold of 10), and;

(e) otherwise applying the second matrix to the color components of the pixel to create the output color component (column 3, lines 45-55: a second matrix with K=8 is applied when the color component is not greater than 10).

Regarding claim 7, Sobol's method is repeated for each pixel in the image (i.e. the entire image is filtered).

Regarding claim 8, Sobol teaches repeating the method to create a new output color component for each of the color components in the color image (column 4, lines 31-37: method is carried out for each of the color components).

Regarding claim 9, Sobol discloses a different threshold is used to create each output color component in the color image (column 3, lines 45-55 and column 4, lines 13-30: Sobol teaches that the thresholds for the color components can be different from 10 and can take on any of a number of other values: 20, 30, 40, 60, 80, etc.).

Regarding claim 10, Sobol discloses there are different matrices for creating each output color component in the color image (column 2, lines 55-67: the K parameter can be assigned to any desired value to generate any of numerous different matrices).

Reagrding claim 11, Sobol teaches the threshold is approximately 10 eight bit counts (column 3, lines 45-55: the threshold is 10).

Regarding claim 12, Sobol teaches the threshold is approximately 6 eight bit counts (column 3, lines 45-55: the threshold is 10, which is substantially close to 6).

Regarding claim 13, Sobol discloses a scanner (figure 2), comprising:

a photo-sensor array for converting an image into an electrical signal (200, figure 2);

an A-to-D converter to convert the electrical signal into raw digital data (204, figure 2);

a matrix for transforming the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel (column 2, lines 55-67; column 4, lines 30-37);

the scanner configured to output the corrected color component for that pixel only when the raw digital data for at least one of the color components of that pixel is greater than a pre-selected value (column 2, lines 17-19; column 4, lines 30-37: color components with low intensity receive no filtering; color components with high intensity receive filtering).

Regarding claim 14, Sobol discloses a method of processing color image data contained in an array of pixels, comprising:

defining a first threshold (30) and a second threshold (10), where the first threshold is larger than the second threshold (see column 3, lines 45-55);

defining a first and a second matrix (column 3, lines 45-55: first matrix is a Laplacian with K=1; second matrix is a Laplacian with K=8);

(a) reading the color components of a pixel (column 4, lines 31-37: R, G, and B color components are read for each pixel);

(b) applying the first matrix to the color components of the pixel when any color component is greater than the first threshold (column 3, lines 45-55: first matrix (K=1) is applied when color component is above the first threshold of 30);

(c) applying the second matrix to the color components of the pixel when all the color components of the pixel are less than the second threshold (column 3, lines 45-55: second matrix (K=8) is applied when color component is below the second threshold of 10), and;

(d) otherwise applying an interpolation between the first and second matrix to the color components of the pixel (figure 1C: pixels with high values are strongly filtered; pixels with low values are not/weakly filtered; and pixels in the mid-range are filtered by a mid-range filter, so that the transition from strong to weak filtering is blended, or interpolated);

repeating steps (a) through (d) for each pixel in the array (i.e. for Sobol's system, the entire image is filtered).

Regarding claim 15, Sobol discloses a method of processing data contained in an array of pixels, comprising:

defining a threshold (column 3, lines 45-55: a threshold of 20);

defining a range around the threshold, the range having a top end and a bottom end (column 3, lines 45-55: top end of 30; a bottom end of 10);

defining a matrix (column 2, lines 55-67: Laplacian matrix is defined);

(a) reading the color components of a pixel (column 4, lines 31-37: R, G, and B color components are read for each pixel);

(b) applying the matrix to the color components of the pixel when any of the color components are above the top end of the range (column 3, lines 45-55: when the color component is above 30, then the Laplcian with K=1 is applied);

(c) modifying the color components of the pixel by interpolation when all of the color components are below the top end of the range and at least one color component is above the bottom end of the low range (figure 1C: pixels with high values are strongly filtered; pixels with low values are not/weakly filtered; and pixels in the mid-range are filtered by a mid-range filter, so that the transition from strong to weak filtering is blended, or interpolated, when at least one color component is above the bottom end of the range) and;

otherwise preserving the pixel (i.e. color components below the bottom end of the range are subjected to no filtering (or very weak filtering), so that they are substantially preserved).

Regarding claim 16, Sobol discloses repeating the steps (a) through (c) for each pixel value in the array (i.e. the entire image is filtered).

Regarding claim 17, Sobol discloses steps (a) through (c) are repeated to create a new output color component for each of the color component in the color image (column 4, lines 31-37: method is carried out for each of the color components).

Regarding claim 18, Sobol discloses a different threshold is used to create each output color component in the color image (column 3, lines 45-55 and column 4, lines 13-30: Sobol teaches that the thresholds for the color components can be different from 30 and can take on any of a number of other values: 20, 40, 60, etc.).

Regarding claim 19, Sobol discloses there are different matrices for creating each output color component in the color image (column 2, lines 55-67: the K parameter can be assigned to any desired value to generate any of numerous different matrices).

Reagrding claim 20, Sobol teaches the threshold is approximately 10 eight bit counts (column 3, lines 45-55: the threshold is 10).

Regarding claim 22, Sobol teaches the threshold is approximately 6 eight bit counts (column 3, lines 45-55: the threshold is 10, which is substantially close to 6).

Regarding claim 23, Sobol discloses a scanner (figure 2), comprising:

a photo sensor array for converting an image into an electrical signal (200, figure 2);

an A-to-D converter to convert the electrical signal into raw digital data (204, figure 2);

a first matrix and a second matrix, both matrixes for transforming the raw digital data for color components for each of a plurality of pixels into a corrected color component for that pixel (column 3, lines 45-55: first matrix is Laplacian of K=1; second matrix is Laplacian of K=-2);

the scanner configured to create the corrected color component for that pixel by selecting between the first and second matrix as a function of the raw digital data value (column 3, lines 45-55; column 4, lines 30-37: the first matrix and second matrix are selectively applied based on the value of the color components).

Regarding claim 24, Sobol discloses a computer readable medium (processor 208, figure 2 processes instructions) containing a program for adjusting the data from the color components for pixels in a color image, comprising:

a matrix (column 2, lines 55-67: Laplacian matrix);

the program configured to modify the data from a color component for a pixel of the color image based on the data for the color components for the pixel using the matrix only when the data from at least one of the color components for the pixel is above a predetermined value (column 2, lines 17-20; column 4, lines 30-37: filtering is only applied when a color component value is sufficiently high).

Regarding claim 27, Sobol discloses a method of processing color image data contained in an array of pixels, comprising:

(a) defining at least three thresholds (column 3, lines 45-55: threshold of 10 is set; column 4, lines 31-37: each color components is processed separately, so a threshold of 10 exists for each of the three color components);

(b) defining a first and a second matrix (column 3, lines 45-55: a Laplacian matrix with K=4 is a first matrix, and a Laplacian matrix with K=8 is a second matrix);

(c) reading at least 3 color component for a pixel (column 4, lines 31-37: R, G, and B color components are read for each pixel);

(d) applying the first matrix to the color components of the pixel to create an output color component when the first color component is larger than the first threshold or the second color component is larger than the second threshold or the third color component is larger than the third threshold (column 3, lines 45-55: if the first color component is greater than 10, then the first matrix (K=4) is applied to the color component; the same process is carried out for the second and third color components), and;

(e) otherwise applying the second matrix to the color components of the pixel to create the output color component (column 3, lines 45-55: if the first color component is less than 10, then the second matrix (K=8) is applied to the color component; the same process is carried out for the second and third color components);

(f) repeating steps (c) through (e) for each pixel in the array (i.e. the entire image is filtered).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sobol.

Sobol discloses substantially the claimed invention as discussed above for claim 15.

Sobol does not disclose expressly the range is approximately 2 eight bit counts.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to utilize a range of 2 eight bit counts. Applicant has not disclosed that this feature provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the range disclosed by Sobol because both ranges perform the same function of designating intensity regions where different filtering is performed. Therefore, it would have

been obvious to one of ordinary skill in this art to modify Sobol to obtain the invention as specified in claim 21.

5. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sobol in view of U.S. Patent 5,214,470 by Denber.

Regarding claims 25 and 26, Sobol discloses a camera (figure 2), comprising:

a photo sensor (200, figure 2);

a matrix for mapping image data (column 2, lines 55-67: Laplacian matrix); and

a processor configured to map color components of the image data only when the image data from at least one color component exceeds a predetermined value (208, figure 2 and column 2, lines 17-20; column 4, lines 30-37: filtering is only applied when a color component value is sufficiently high).

Sobol does not expressly disclose the camera comprises a lens system that forms an image on the photo sensor.

Denber discloses a lens (20, figure 1) for forming images on a photsensor (22, figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Sobol by Denber to include a lens, since a lens allows light to be focused onto photosensor, thereby allowing an electronic image to be captured.

(10) Response to Argument

Regarding claim 1, Appellant asserts that Sobol does not disclose, "selectively applying a matrix to the color components (plural) to create an output color component (singular)" (see p. 8

of the Appeal Brief). Appellant then asserts that Sobol applies a matrix "to either a single color component or a single lightness coordinate value ... to produce a single value" (Brief, p. 8).

However, as pointed out by the Examiner previously, Sobol expressly teaches applying the matrix to *each* color component – "the above variable filter approach may be used on each color coordinate if appropriate" (column 4, lines 30-33). Applying the filter (i.e. matrix) to each color component produces an output for each color component. For example, if a matrix is applied to each of the red, green, and blue color components, then three outputs are produced.

Appellant seems to argue that the claim does not read on Sobol because Sobol produces three outputs, whereas the claim calls for "*an* output color component." However, as noted in the Final Rejection (see paragraph 3 above), the claim does not preclude more than one output.

The claim calls for creating "an" output. With the absence of qualifying language such as "only one output" or "exactly one output," this construction of the claim does not preclude creating multiple outputs.

Regarding claim 4, Appellant generally alleges that Sobol does not teach the claim limitations. There appears to be no explanation other than, "[i]n Sobol, it appears that each color component is handled separately" (Brief, p. 9). It is unclear to the Examiner how such an assertion effectively rebuts the interpretation of Sobol proffered in the Final Rejection. Even if Sobol were to "handle each color component separately," Appellant has failed to explain how this fact negatives the validity of the current rejection. The Examiner is unable to extrapolate Appellant's arguments from a single assertion and is thus unable to provide a substantive response herein.

A prima facie case of anticipation of claim 4 by Sobol was established in the Final Rejection. The burden has shifted to the Appellant to provide specific facts, affidavits, reasoning, analysis, evidence, or otherwise to rebut the specific grounds of the rejection and the Examiner's interpretation of the applied reference. Appellant has provided nothing more than general allegations of nondisclosure of claim limitations by Sobol, and such general allegations are not sufficient to overcome a presumably valid rejection. Therefore, the Examiner maintains the rejection of claim 4.

Regarding claim 6, Appellant appears to present only general allegations of Sobol's nondisclosure of claim limitations. Appellant's remarks do not address the merits of the Examiner's rejection, and therefore, the Examiner is unable to provide a substantive response. In the absence of specific facts, affidavits, reasoning, analysis, evidence, or otherwise to rebut the specific grounds of the rejection and the Examiner's interpretation of the applied reference, the Examiner maintains the rejection of claim 6.

Regarding claims 13, 15, 23, 24, 27, Appellant appears to present only general allegations of Sobol's nondisclosure of claim limitations, and the above remarks with respect to claim 6 are applicable to each of these claims.

Regarding claim 14, Appellant urges that Sobol does not teach, "applying an interpolation between the first and second matrix to the color components of the pixel when all of the color components are between the thresholds" (Brief, p. 11). Appellant then states that,

"[t]he Examiner attempts to characterize the use of a set of matrices as meeting the interpolation limitation of the claim. There is nothing in Sobol that teaches or suggests that the matrices used in Sobol implement an interpolation function between two matrices" (Brief, p. 11).

Examiner respectfully disagrees with these assertions. Generally speaking, an "interpolation" is defined as an estimation of values of a function between two known values. Appellant does not expressly define this term, but the Specification does not appear to depart from this customary definition of "interpolation" (see p. 8 of the Specification).

The Final Rejection interprets Sobol as teaching the step of applying an "interpolation between the first and second matrix to the color components," as claimed: Figure 1C of Sobol illustrates the variable Laplacian operator, which is applied to each of the color components of a pixel as a variable Laplacian matrix, such as shown at the bottom of column 2. Color components in the darker areas 106 are "barely exaggerated" (slight filtering) whereas color components in the lighter areas (108) are "greatly exaggerated" (high filtering) (column 3, lines 61-66). However, in the mid-range areas that are between two thresholds such as 20 and 40, the color components are considered to be moderately exaggerated, or moderately filtered. Therefore, the filtering applied to the mid-range values can be considered as an "interpolation" between high filtering and low filtering.

Modifying the K parameter to be 1, 2, 4, or 8 produces different strengths for the filter. Fig. 1C illustrates how e.g. a Laplacian matrix with K=4 is essentially an interpolation between K=8 and K=2. At K=2, there is strong filtering, whereas at K=8, there is relatively weak filtering. The filter matrix with K=4 represents a midrange, or interpolation, between the matrices of K=8 and K=2. This interpretation of "an interpolation between the first and second matrix" is

presumed to be reasonable in light of the fact that Appellant nominally recites "an interpolation" between two matrices and does not expressly point out or claim how such an interpolation is generated. Sobol may, in fact, not teach the specific way in which the Appellant "interpolates" between the two matrices, however, the details of the interpolation are not claimed.

Regarding claims 25 and 26, Appellant appears to present only general allegations of the nonobviousness of the claim limitations. Appellant's remarks do not address the merits of the Examiner's rejection, and therefore, the Examiner is unable to provide a substantive response. In the absence of specific facts, affidavits, reasoning, analysis, evidence, or otherwise to rebut the specific grounds of the rejection, the Examiner's interpretation of the applied references, and the motivation to combine teachings, the Examiner maintains the rejections of claims 25 and 26.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Colin LaRose

Conferees:
Joe Mancuso
Amelia Au